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(54) PACKAGES

(71) We, SIDAPLAX, a Société Anonyme (Naamloze Vennootschap) organised under the laws of Belgium, of Kerkstraat 26—28, 9001 Gentbrugge, Belgium, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to packages and in particular to packages that comprise containers overwrapped with a film of thermoplastic resin.

Packages comprising containers have enjoyed increasingly widespread use especially in the packing of food such as meat, fish, vegetables and fruit. The containers can be made in a variety of shapes and sizes but usually the opening of the container has a flange or rim around its periphery which imparts strength to the container. When the food or other article has been placed in the container it is usual to apply some form of covering to preserve and enclose the article and to form the package. Various materials and techniques have been employed for this purpose but one favoured method is to wrap a film of thermoplastic resin over the contents of the container and to stretch or shrink the film to form a package, the film being sealed to itself or to a wall of the container by for example heat-sealing. However it has been found that in stretching or shrinking the film over the article or other contents in the container there is a tendency for the film to adhere to the flange or rim rather than slide over it. This causes difficulties and often results in a package with a wrinkled or loose film rather than the desired tight package. An improved packaging container has now been found whereby these difficulties can be substantially overcome.

The package of the present invention comprises a container holding an article or other contents, and a film of thermoplastic resin wrapped over the article or other contents of the container, the container having an opening surrounded by a flange or rim, the flange or

rim bearing a raised pattern and the film being sealed to itself or to the wall of the container.

Also included in the invention is a method of packing an article in a container having an opening surrounded by a flange or rim, the flange or rim bearing a raised pattern that comprises wrapping a film of thermoplastic resin over an article placed in the container and sealing the film to itself or to a wall of the container, the wrapping being facilitated by sliding contact of the film over the raised pattern of the flange or rim of the container. The package resulting from this method of packing is also included as part of the invention.

Wrapping is facilitated when, for example, a film is stretched over the container before sealing, or when a film is caused to shrink after sealing. Both stretching and shrinking can occur, for example, when the film is a composite one comprising a stretch film for stretching over the opening of the container joined to a shrink film that can be shrunk by heat for further tightening of the film. This type of overwrapping depends to a large extent on the smooth sliding of the film over the flange or rim.

The raised pattern on the flange or rim of the container can take a wide variety of forms. It serves to reduce the friction between the film and the surface of the flange or rim as the covering sheet is stretched or shrunk over the contents of the container. A raised pattern that is quite simple can be very effective, such as a series of projections, for example part-spherical, part-ellipsoidal, frusto-conical, cylindrical, conical or pyramidal projections, closely spaced ribs, a lattice or criss-cross pattern or knurling. As an alternative the raised pattern can be in the form of serrations, for example regular tooth-shaped or triangular serrations, that extend around part or the whole of the periphery of the flange or rim. The raised pattern can be confined to the parts of the flange or rim most likely to make contact with the film and can for example cover the outer part of the upper surface of

the flange or rim or the upper part of the vertical parts of the flange or rim, so that for example from 10 to 50% of the outer or upper part is covered with the raised pattern. However the raised pattern preferably extends over the whole of the rim or upper surface of the flange and over the entire length of the flange or rim. Preferably any vertical parts of the flange or rim are entirely covered by the raised pattern. We have found that a raised pattern that is confined to spaced portions of the flange or rim is also effective. For example in passing round the rim or flange, portions of the rim or flange from 0.5 to 3 centimetres in length bearing a raised pattern can alternate with portions of the rim or flange from 0.5 to 3 centimetres in length that bear no raised pattern. Preferably the raised pattern projects 0.1 to 3 millimetres such as 0.3 to 1.5 millimetres from the surface of the flange or rim; in the case of serrations the surface of the flange or rim being regarded as the surface which passes through the valleys of the serrations. The projections forming the raised pattern can extend across the whole of the upper surface or vertical parts of the flange or rim, but in general they are from 0.3 to 4 millimetres, such as from 0.5 to 2 millimetres in length.

An example of a container according to the invention is illustrated in the drawings accompanying the Provisional Specification, in which:

Figure 1 shows a section through a packing container which is in the form of a tray having a body portion 1 and horizontal flanges, 2 and 3. The flanges bear a raised pattern that extends across the whole of their upper surface.

Figure 2 shows a plan view of a portion of the upper surface of one of the flanges shown in Figure 1, much enlarged. The raised pattern is in the form of a regular array of projections such as 4 and 5.

Figure 3 shows a section through the portion of flange illustrated in Figure 2 taken along the line A—A indicated in that Figure.

The container includes a wide range of receptacles suitable for packing liquids and semi-solids such as for example drinks and dairy products but it is especially useful in packing solids for instance foodstuffs such as meat, fish and vegetables. When the container is used for packing foodstuffs it can often be in the form of a shallow receptacle such as a tray of rectangular or other convenient shape. In packing the article it can be allowed to protrude from the opening of the shallow receptacle, the covering film being stretched or shrunk over and around the article to accommodate it. Bottles or jars as well as trays and other receptacles having an opening which can be sealed are also envisaged.

Preferably the container is made from a plastics material although for example, paper

pulp or cardboard containers can also be used. Containers constructed from a sheet of thermoplastic resin are particularly useful for instance a polyacrylate, a polymethacrylate, a polycarbonate, polyvinyl chloride, polyethylene terephthalate, isotactic polypropylene, polystyrene, or a styrene copolymer such as for example a styrene/acrylonitrile copolymer. The most preferred materials are polymers and copolymers of styrene, particularly a biaxially orientated polystyrene such as is sold under the name POLYFLEX (Registered Trade Mark).

When the container is composed of a thermoplastic resin it is preferably thermoplastic formed from a sheet of the material by for example vacuum or pressure forming, but it can also be made by injection moulding or by the use of matching male and female dies or by compression moulding. With such methods it is easy to form a raised pattern on the flange or rim by means of an appropriate pattern-bearing shaping member during the production of the container. Alternatively the raised pattern can be embossed onto the rim or flange after the body of the container has been formed or, when the raised pattern is in the form of serrations, these can be cut from the periphery of the flange or rim.

The covering film is of thermoplastic resin that can be stretched or shrunk over the article placed in the container or over the contents of the container. There are many appropriate materials for this use but the most preferred material is a film comprising polyvinyl chloride. Other materials that can be used include biaxially orientated polystyrene and high impact polystyrene; polyvinyl halides; polyvinylidene chloride; rubber hydrochloride; orientated or irradiated polyethylene; and orientated polypropylene. Normally the thickness of the covering film is from 0.01 to 0.075 millimetre, such as from 0.02 to 0.06 millimetre.

In a method according to the invention the covering film is stretched or shrunk over the article placed in the container and sealed to itself or to a wall (side or base wall) of the container. When the covering film is sealed to itself the seal is usually made between the ends of the film drawn around and underneath the container and at its base wall. A number of methods for sealing can be employed and these include the use of adhesive, solvent, or heat sealing techniques by contact, hot air or radiated heat. When the container is composed of a plastics material the most preferred method is by heat sealing and the temperature employed in the heat sealing needs to be sufficient to ensure a proper seal which is preferably hermetic when the article to be packed is a foodstuff. A few experiments may be necessary to determine the best sealing temperature to employ for a given set of circumstances. Examples of suitable methods are described

in our British Patent Specifications Nos. 1,206,667 and 1,241,425.

The invention is illustrated by the following Example.

5

EXAMPLE

This Example describes a container in the form of a meat tray and a method of packing meat in the tray according to the invention.

10 The tray was 10 centimetres square and 1.75 centimetres deep and had around its edge a flange 0.8 centimetre wide. It was formed from a sheet of biaxially orientated polystyrene, POLYFLEX (Registered Trade
15 Mark) of 0.25 millimetre thickness by vacuum thermoforming at a temperature of 110°C, the moulding member being appropriately shaped with parts for embossing on the flange a knurled pattern consisting of a regular array
20 of tiny projections, over the whole of the upper surface of the flange, as shown in Figures 2 and 3 of the drawings accompanying the Provisional Specification. The projections had an average length of about 1
25 millimetre and a height of about $\frac{1}{2}$ millimetre.

A piece of meat was placed in the tray, part of it projecting from the opening of the tray. A covering film of polyvinyl chloride of 0.025 millimetre thickness was placed over the
30 tray, stretched mechanically and folded under the base wall of the tray. During stretching the covering film made sliding contact with the flange and because of its knurled pattern friction between film and flange was reduced
35 and there was hardly any tendency for the film to adhere to the flange. No difficulties were experienced in obtaining complete and unhindered stretching of the film.

The stretched covering film was sealed to
40 itself at the base wall of the container to provide an excellent seal that effectively prevented the entry of dirt and air into the sealed container.

The resulting packaged meat had excellent
45 visual appearance. It was easy to handle and the sealed covering sheet excluded dirt from the enclosed meat and prevented blood and meat juices from leaking out of the package.

In a comparative experiment using a similar
50 container but with a flat range, it was found that overwrapping was difficult because of a marked tendency for the film to stick to the flange.

WHAT WE CLAIM IS:—

55 1. A package comprising a container holding an article or other contents and a film of thermoplastic resin wrapped over the article or the contents of the container, the container having an opening surrounded by a flange or
60 rim, the flange or rim bearing a raised pattern and the film being sealed to itself or to a wall of the container.

2. A package according to Claim 1, in

which the opening is surrounded by a flange and the raised pattern extends over the whole
65 of the upper surface of the flange and over the entire length of the flange.

3. A package according to Claim 1, in which the opening is surrounded by a rim
70 and the raised pattern extends over the whole of the rim and over the entire length of the rim.

4. A package according to Claim 1, in which the vertical parts of the flange or rim
75 are entirely covered by the raised pattern.

5. A package according to any of the preceding claims, in which the raised pattern projects from 0.3 to 1.5 millimetre from the surface of the flange or rim.

6. A package according to any of the preceding claims, in which the raised pattern is a series of projections.

7. A package according to Claim 6, in which the series of projections are closely
85 spaced ribs, a lattice or criss-cross pattern or knurling.

8. A package according to either of Claims 6 and 7, in which the projections are from 0.5 to 2 millimetres in length.

9. package according to any of Claims 1,
90 3 to 6 and 8, in which the raised pattern is in the form of serrations.

10. A package according to any of the preceding claims, in which the film comprises
95 polyvinyl chloride.

11. A package according to any of the preceding claims, in which the film has a thickness of from 0.02 to 0.06 millimetre.

12. A package according to any of the preceding claims, in which the packaging
100 container is made of polystyrene or a copolymer of styrene.

13. A package according to any of Claims 1 and 5 to 12, in which the raised pattern is confined to spaced portions of the flange or
105 rim.

14. A package according to Claim 1 substantially as described with reference to the
110 Figures 1 to 3 of the drawings accompanying the Provisional Specification.

15. A method of packing an article in a container having an opening surrounded by a flange or rim bearing a raised pattern that
115 comprises wrapping a film of thermoplastic resin over an article placed in the packaging container and sealing the film to itself or to a wall of the container, the wrapping being facilitated by sliding contact of the film over the raised pattern of the flange or rim of the
120 container.

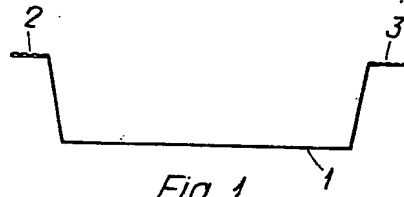
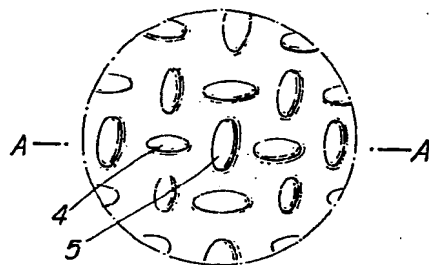
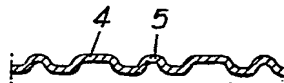
16. A method according to Claim 15, in which the opening is surrounded by a flange and the raised pattern extends over the whole
125 of the upper surface of the flange and over the entire length of the flange.

17. A method according to Claim 15, in which the opening is surrounded by a rim and the raised pattern extends over the whole

- of the rim and over the entire length of the rim.
18. A method according to Claim 15, in which the vertical parts of the flange or rim are entirely covered by the raised pattern.
- 5 19. A method according to any of Claims 15 to 18 in which the raised pattern projects from 0.3 to 1.5 millimetre from the surface of the flange or rim.
- 10 20. A method according to any of Claims 15 to 19 in which the raised pattern is a series of projections.
21. A method according to Claim 20, in which the series of projections are closely spaced ribs, a lattice or criss-cross pattern or knurling.
- 15 22. A method according to either of Claims 20 and 21 in which the projections are from 0.5 to 2 millimetres in length.
- 20 23. A method according to any of Claims 15, 17 to 20 and 22, in which the raised pattern is in the form of serrations.
24. A method according to any of Claims 15 to 23 in which the film comprises poly-
- 25 vinyl chloride.
25. A method according to any of the preceding claims, in which the film has a thickness of from 0.02 to 0.06 millimetre.
26. A method according to any of Claims 15 to 25, in which the packaging container is made of polystyrene or a copolymer of styrene.
- 30 27. A method according to any of Claims 15, 19 to 26 in which the raised pattern is confined to spaced portions of the flange or rim.
- 35 28. A method according to Claim 15 substantially as described with reference to the Example.
29. A package comprising an article in a container that has been packed by a method according to any of Claims 15 to 26 and 28.
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*Fig. 1.**Fig. 2.**Fig. 3.*